

General

Guideline Title

Nonnutritive sweeteners: current use and health perspectives: a scientific statement from the American Heart Association and the American Diabetes Association.

Bibliographic Source(s)

Gardner C, Wylie-Rosett J, Gidding SS, Steffen LM, Johnson RK, Reader D, Lichtenstein AH, American Heart Association Nutrition Committee of the Council on Nutrition [trunc]. Nonnutritive sweeteners: current use and health perspectives: a scientific statement from the American Heart Association and the American Diabetes Association. *Circulation*. 2012 Jul 24;126(4):509-19. [58 references] [PubMed](#)

Guideline Status

This is the current release of the guideline.

Recommendations

Major Recommendations

Conclusions and Recommendations

At this time, there are insufficient data to determine conclusively whether the use of nonnutritive sweeteners (NNS) to displace caloric sweeteners in beverages and foods reduces added sugars or carbohydrate intakes, or benefits appetite, energy balance, body weight, or cardiometabolic risk factors. Limiting added sugars is an important strategy for supporting optimal nutrition and healthy weights, as concluded in the 2009 American Heart Association scientific statement "Dietary Sugars Intake and Cardiovascular Health" (Johnson et al., 2009). Monitoring carbohydrate intake, which includes limiting added sugars, is also a key strategy to achieve glycemic control as published in the American Diabetes Association (ADA) clinical practice recommendations (ADA, 2012). There are some data to suggest that NNS may be used in a structured diet to replace sources of added sugars and that this substitution may result in modest energy intake reductions and weight loss. Successful reduction in energy intake requires that there is incomplete compensation of energy reduction from the use of NNS-containing beverages and/or foods. The impact of incorporating NNS and NNS-containing beverages and foods on overall diet quality should be included in assessing the overall balance of benefits and risks. Apparent from the available literature is the paucity of data from well-designed human trials exploring the potential role of NNS in achieving and maintaining a healthy body weight and minimizing cardiometabolic risk factors.

The evidence reviewed suggests that when used judiciously, NNS could facilitate reductions in added sugars intake, thereby resulting in decreased total energy and weight loss/weight control, and promoting beneficial effects on related metabolic parameters. However, these potential benefits will not be fully realized if there is a compensatory increase in energy intake from other sources.

Clinical Algorithm(s)

None provided

Scope

Disease/Condition(s)

- Cardiovascular disease
- Cardiometabolic syndrome
- Coronary heart disease
- Diabetes mellitus type 2
- Overweight and obesity

Guideline Category

Counseling

Prevention

Clinical Specialty

Cardiology

Endocrinology

Family Practice

Internal Medicine

Nutrition

Pediatrics

Preventive Medicine

Intended Users

Advanced Practice Nurses

Allied Health Personnel

Dietitians

Health Care Providers

Nurses

Physician Assistants

Physicians

Guideline Objective(s)

- To address the potential role of nonnutritive sweeteners (NNS) in helping Americans to adhere to population-wide reductions in added

sugars intake in the context of current usage and health perspectives

- To review the literature to determine whether there were adequate data to provide guidance for the use of NNS

Target Population

Adults and children in the United States who desire to reduce added sugars intake for decreased total energy intake and weight loss/weight control or to promote beneficial effects on related metabolic parameters

Interventions and Practices Considered

Counseling on use of nonnutritive sweeteners in beverages and foods as a replacement for caloric sweeteners

Major Outcomes Considered

- Prevalence of nonnutritive sweetened beverage and food intake among U.S. children and adults
- Consumer attitudes towards nonnutritive sweeteners (NNS)
- Effects of NNS on appetite, hunger, and energy intake
- Effects of NNS on body weight, cardiometabolic variables, and diabetes mellitus/glycemic response

Methodology

Methods Used to Collect/Select the Evidence

Hand-searches of Published Literature (Primary Sources)

Hand-searches of Published Literature (Secondary Sources)

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

The literature search was conducted by using the following search terms: nonnutritive sweetener(s), artificial sweetener(s), noncaloric sweetener(s), diet (beverages and soft drinks), and the names of each of the 6 nonnutritive sweeteners (NNS) available for use in the United States (including their brand names). The initial search by use of PubMed was limited to original research published after 2000, studies conducted in humans (primarily restricted to controlled trials and prospective cohort studies), and systematic reviews. Additional articles were identified by use of the literature cited in the original publications and review articles, and the Evidence Analysis Library of the American Dietetic Association (<http://www.adaevidencelibrary.com/>) , as well. A Google search was used to identify published marketing research related to consumer views of NNS.

The focus of the statement is on the 6 NNS that are described in Table 1 of the original guideline document. Aspartame, acesulfame-K, neotame, saccharin, and sucralose are regulated as food additives by the US Food and Drug Administration and therefore had to be approved as safe before being marketed. Regarding stevia, at this time, the US Food and Drug Administration has not made a determination as to the Generally Recognized As Safe status, but has issued no objection letters for a number of Generally Recognized As Safe notifications for stevia sweeteners (<http://www.fda.gov/Food/FoodIngredientsPackaging/GenerallyRecognizedasSafeGRAS/GRASNotificationProgram/default.htm>). Because all 6 of these NNS have current US Food and Drug Administration approval, issues related to safety of these compounds are not addressed. In addition, the review of the literature is primarily restricted to human studies in which noncaloric sweeteners are used as a replacement for caloric sweeteners.

Number of Source Documents

Not stated

Methods Used to Assess the Quality and Strength of the Evidence

Expert Consensus

Rating Scheme for the Strength of the Evidence

Not applicable

Methods Used to Analyze the Evidence

Review

Review of Published Meta-Analyses

Description of the Methods Used to Analyze the Evidence

Not stated

Methods Used to Formulate the Recommendations

Expert Consensus

Description of Methods Used to Formulate the Recommendations

Not stated

Rating Scheme for the Strength of the Recommendations

Not applicable

Cost Analysis

A formal cost analysis was not performed and published cost analyses were not reviewed.

Method of Guideline Validation

Internal Peer Review

Description of Method of Guideline Validation

This document was approved by the American Heart Association (AHA) Science Advisory and Coordinating Committee on April 18, 2012, and by the American Diabetes Association Executive Committee on April 19, 2012.

Expert peer review of AHA Scientific Statements is conducted by the AHA Office of Science Operations. For more on AHA statements and guidelines development, visit <http://my.americanheart.org/statements> and select the "Policies and Development" link.

Evidence Supporting the Recommendations

References Supporting the Recommendations

American Diabetes Association. Standards of medical care in diabetes--2012. *Diabetes Care*. 2012 Jan;35(Suppl 1):S11-63. [PubMed](#)

Johnson RK, Appel LJ, Brands M, Howard BV, Lefevre M, Lustig RH, Sacks F, Steffen LM, Wylie-Rosett J, American Heart Association Nutrition Committee of the Council on Nutrition [trunc]. Dietary sugars intake and cardiovascular health: a scientific statement from the American Heart Association. *Circulation*. 2009 Sep 15;120(11):1011-20. [PubMed](#)

Type of Evidence Supporting the Recommendations

The type of supporting evidence is not specifically stated for each recommendation.

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

The evidence reviewed suggests that when used judiciously, nonnutritive sweeteners could facilitate reductions in added sugars intake, thereby resulting in decreased total energy and weight loss/weight control, and promoting beneficial effects on related metabolic parameters. However, these potential benefits will not be fully realized if there is a compensatory increase in energy intake from other sources.

Potential Harms

Not stated

Qualifying Statements

Qualifying Statements

The literature search yielded relatively few research studies that focused on the specific objective of this scientific statement, the potential role of nonnutritive sweeteners (NNS) in facilitating reduction of added sugars intake in humans. This is likely attributable to inherent complexities involved in the design and implementation of these types of studies. In particular, experimental studies designed to test the effects of NNS on health outcomes in food are particularly challenging, because replacing added sugars with NNS alters dietary composition (i.e., assuming portion size is not reduced, the relative proportions of fat, protein, and carbohydrate may be changed or the nature of the carbohydrate alone may be changed) in ways that can add potential confounding to the simple comparison of added sugars versus NNS. The majority of the human data in prospective observational studies and randomized controlled trials on the use of NNS focus specifically on diet soft drinks as a replacement/displacement of regular soft drinks. Assessment in large prospective cohorts of the use of NNS from sources other than diet soft drinks has been limited methodologically by such factors as lack of specificity in intake data collected by food frequency questionnaires (FFQs) and lack of accurate NNS composition values in available databases. Much of the published literature on NNS addresses research conducted in animal models and evaluations of potential toxicity, neither of which were areas of focus for this statement. Hence, the review that follows is notably limited by the lack of an extensive evidence base.

Implementation of the Guideline

Description of Implementation Strategy

An implementation strategy was not provided.

Implementation Tools

Patient Resources

Resources

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Living with Illness

Staying Healthy

IOM Domain

Effectiveness

Patient-centeredness

Identifying Information and Availability

Bibliographic Source(s)

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Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2012 Jul 24

Guideline Developer(s)

American Diabetes Association - Professional Association

American Heart Association - Professional Association

Source(s) of Funding

American Heart Association

Guideline Committee

American Heart Association Nutrition Committee of the Council on Nutrition, Physical Activity and Metabolism, Council on Arteriosclerosis, Thrombosis and Vascular Biology, Council on Cardiovascular Disease in the Young

Composition of Group That Authored the Guideline

Writing Group: Christopher Gardner, PhD (*Chair*); Judith Wylie-Rosett, EdD, RD (*Co-Chair*); Samuel S. Gidding, MD, FAHA; Lyn M. Steffen, PhD, MPH, RD, FAHA; Rachel K. Johnson, PhD, MPH, RD; Diane Reader, RD, CDE; Alice H. Lichtenstein, DSc, FAHA

Financial Disclosures/Conflicts of Interest

The American Heart Association and the American Diabetes Association make every effort to avoid any actual or potential conflicts of interest that may arise as a result of an outside relationship or a personal, professional, or business interest of a member of the writing panel. Specifically, all members of the writing group are required to complete and submit a Disclosure Questionnaire showing all such relationships that might be perceived as real or potential conflicts of interest.

See the original guideline document for a complete list of writing group and reviewer disclosures.

Guideline Status

This is the current release of the guideline.

Guideline Availability

Electronic copies: Available from the [Circulation Journal Web site](#) and the [Diabetes Care Journal Web site](#) .

Print copies: Available from the American Heart Association, Public Information, 7272 Greenville Ave, Dallas, TX 75231-4596; Phone: 800-242-8721

Availability of Companion Documents

The following are available:

- Non-nutritive sweeteners: what do they offer to a heart healthy diet? Commentary. Electronic copies: Available from the [American Heart Association \(AHA\) Web site](#) .
- Top ten things to know. Non-nutritive sweeteners (NNS). Electronic copies: Available in Portable Document Format (PDF) from the [AHA Web site](#) .

Print copies: Available from the American Heart Association, Public Information, 7272 Greenville Ave, Dallas, TX 75231-4596; Phone: 800-242-8721

Patient Resources

The following are available:

- Non-nutritive sweeteners (artificial sweeteners). Electronic copies: Available from the [American Heart Association \(AHA\) Web site](#)

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- Frequently asked questions. Nonnutritive sweeteners: current use and health perspectives: a scientific statement from the American Heart Association and the American Diabetes Association. Electronic copies: Available in Portable Document Format (PDF) from the [AHA Web site](#) .

Print copies: Available from the American Heart Association, Public Information, 7272 Greenville Ave, Dallas, TX 75231-4596; Phone: 800-242-8721

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NGC Status

This summary was completed by ECRI Institute on October 31, 2012. The information was verified by the guideline developer on December 3, 2012.

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